A c L O n e t: A Method to Facilitate Automatic Learning-Object Assembly

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Introduction

A c L O n e t = "Assembly from a Collaborative Learning-Object NETwork"

It automatically assembles Learning Objects (LOs) into lessons, in the domain of elementary geometry. For the purpose of this poster, an LO is any digital resource (e.g., text, web page, or picture) that can be

used to build a lesson (see Figure 1). Our approach considers the following questions:

* What metadata are needed to make semantic assembly possible?

How would an instructor assemble a group of LOs based on these metadata?



Figure 1: Course Structure

Representing LOs

Metadata = "data that describe other data"

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A c L O n e t uses an LO representation based on established standards, specifically IEEE's LOM (Learning Object Metadata).

* We found the following metadata particularly useful when attempting automatic assembly:

* LOM: location, typical learning time, typical age range, learning resource type (e.g., exercise) Other: learning objective, topic, subtopic, pre/post knowledge

* Ratings: organisation, ease of use, accuracy



contribution	
request (e.g., topic and duration)	
* output	

Assembly Process

After the user selects the age level, topic, subtopic(s), duration, and learning objective(s) for a module (see Figure 2), A c L O n e t pre-filters the LOs into a candidate set.

This set is then sorted based on topic and subtopic, using an ontology, and based on learning resource types (LRTs). E.g., Lesson LRTs appear in the following order: narrative text, examples, exercises, and exam.

An LO is chosen, with a probability proportional to its overall rating, if more than one LO is available to satisfy any lesson's LRT slot (e.g., two exam LOs).

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Figure 2: Screenshot from the A c L O n e t prototype written in C# (Selection Screen)

Results and Future Work

The current A c L O n e t prototype can assemble four module types, based on topic and duration: perimeter, area, surface area, and volume.

The final application will make fuller use of pre/post knowledge and user-rating information.

The following results are expected:

* A c L O n e t 's solution will yield a semantically meaningful assembly (our test set already contains over 100 geometry LOs); and

The methods used to automatically assemble geometry LOs can be applied to other learning domains, with limited changes.

